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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/039,136

01/04/2002

Stephen W. Montgomery

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11/26/2003

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EXAMINER

PATEL, NIHIR B

ART UNIT

PAPER NUMBER

3743

DATE MAILED: 11/26/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/039,136

Applicant(s)

MONTGOMERY ET AL.

Examiner

Nihir Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on September 22nd, 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-22 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of figures 1-13 in Paper No. 6 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 7-9, 17, 18, 20, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Diemunsch US Patent No. 6,088,223. Referring to claim 1, Diemunsch discloses an electronic apparatus with improved heatsink arrangement that comprises a frame 110 (housing; see figures 1 and 2); a chassis 120 (see figures 1 and 2) inserted into the frame 110; an electronic component 130 (see figures 1 and 2) on the chassis 120; an evaporator block (see figures 2 and 3; column 4 lines 20-25), having an evaporator block internal volume to which the heat from the electronic component is transferred (see column 4 lines 20-25); a capillary wicking material in the internal volume, a fluid flowing into the internal volume being absorbed by the material, the heat evaporating the fluid so that the fluid leaves the internal volume (see figures 2 and 3; column 4 lines 10-20); and a thermal component 150 (see figures 1-3; column 4 lines 1 – 10) mounted to the frame, heat transferring from the fluid to the thermal component after the fluid flows out of the evaporator block (see figures 1-3; and column 4 lines 1-25).

Referring to claim 2, Diemunsch discloses an apparatus wherein a majority of the heat generated by the electronic component transfers to the thermal component.

Referring to claim 3, Diemunsch discloses an apparatus wherein the thermal component is a frame component that comprises a chassis component on the chassis, the heat transferring first to the chassis component and then from the chassis component to the frame component (see figures 1-3).

Referring to claim 4, Diemunsch discloses an apparatus wherein the chassis component has a chassis component internal volume, the fluid flowing through the chassis component internal volume (see figures 103).

Referring to claim 5, Diemunsch discloses an apparatus wherein the fluid condenses in the chassis component internal volume (see figures 1-3).

Referring to claim 7, Diemunsch discloses an apparatus wherein movement of the chassis out of the frame causes thermal disengagement of the chassis component from the frame component (see figures 1-3).

Referring to claim 8, Diemunsch discloses an apparatus wherein the chassis component and the frame component have surfaces contacting one another when the chassis is inserted into the frame (see figures 1-4).

Referring to claim 9, Diemunsch discloses an apparatus wherein each surface has a profiled shape, the shapes of the surfaces complementarily fitting each other (see figures 1-4).

Referring to claim 11, Diemunsch discloses an apparatus wherein one of the surfaces has a tapered recessed profile and the other surface has a tapered raised profile (see figure 1).

Referring to claim 17, Diemunsch discloses an electronic apparatus with improved heatsink arrangement that comprises a frame 110 (housing; see figures 1 and 2); a chassis 120 (see figures 1 and 2) inserted into the frame 110; an electronic component 130 (see figures 1 and

2) on the chassis 120, the electronic component generating heat when operated; an evaporator block (see figures 2 and 3; column 4 lines 20-25) against the electronic component, the evaporating block having an evaporator block internal volume to which the heat is transferred, an evaporator block inlet into the evaporator block internal volume, and an evaporator block outlet out of the evaporator block internal volume (see column 4 lines 20-25); a capillary wicking material in the evaporator block internal volume, a fluid flowing through the evaporator block inlet being absorbed by the capillary wicking material, the heat in the evaporator block internal volume evaporating the fluid so that the fluid leaves the evaporator block internal volume through the evaporator block outlet (see figures 1-3 and column 4 lines 1-25); a chassis component mounted to the chassis, heat transferring from the fluid to the chassis component after the fluid flows out of the evaporator block outlet, whereafter the liquid returns through the evaporator block inlet into the evaporator block internal volume (see figure 3); and a frame component mounted to the frame, the chassis component and the frame component having surfaces that mate when the chassis is inserted into the frame so that heat can transfer from the chassis component through the surfaces to the frame component (see figures 2 and 3).

Referring to claim 18, Diemunsch discloses an apparatus wherein a majority of the heat generated by the electronic component transfers to the thermal component.

Referring to claim 20, Diemunsch discloses an electronic apparatus with improved heatsink arrangement that comprises inserting a chassis into a frame (see figures 1-3); and operating an electronic component mounted to the chassis so that heat transfers from the electronic component to a capillary wicking material, a fluid in the capillary wicking material being evaporated by the heat and flowing away from the capillary wicking material, the heat

transferring from the fluid to thermal component on the frame, whereafter the fluid returns to the capillary wicking material (see figures 1-3).

Referring to claim 21, Diemunsch disclose an apparatus wherein a majority of the heat generated by the electronic component transfers to the thermal component.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12, 13, 14, 15, 16, 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Diemunsch US Patent No. 6,088,223 in view of Patel et al. US Patent No. 6,115,251.

Referring to claim 12, Diemunsch discloses the applicant's invention as claimed with the exception of providing a plurality of chassis inserted into the frame; and a plurality of electronic components, each on a respective chassis, each generating heat when operated.

Patel discloses a cooling apparatus for computer subsystem that provides a plurality of chassis inserted into the frame; and a plurality of electronic components, each on a respective chassis, each generating heat when operated (figure 2). Therefore it would be obvious to modify Diemunsch's invention by providing a plurality of chassis inserted into the frame; and a plurality of electronic components, each on a respective chassis, each generating heat when operated in order to cool computers that contain heavy load of electric components.

Referring to claim 13, Diemunsch discloses the applicant's invention as claimed with the exception of providing a plurality of evaporator blocks

Patel discloses a cooling apparatus for computer subsystem that does provide a plurality of evaporator blocks (see figures 2 and 5). Therefore it would be obvious to modify Diemunsch's invention by providing a plurality of evaporator blocks in order to cool computers that contain heavy load of electric components.

Referring to claims 14 and 15, Diemunsch discloses the applicant's invention as claimed with the exception of providing a plurality of separate thermal components mounted to the frame.

Patel discloses a cooling apparatus for computer subsystem that does provide a plurality of separate thermal components mounted to the frame (see figures 2, 3, and 5). Therefore it would be obvious to modify Diemunsch's invention by providing a plurality of separate thermal components mounted to the frame in order to cool computers that contain heavy load of electric components.

Referring to claim 16, Diemunsch discloses the applicant's invention as claimed with the exception of providing a fluid-channeling structure on the frame, the fluid-channeling structure having a fluid inlet and fluid outlet, heat transferring from each of the thermal components to a fluid after the fluid enters through the fluid inlet and before the fluid exits out of the fluid outlet.

Patel discloses a cooling apparatus for computer subsystem that does provide a fluid-channeling structure on the frame, the fluid-channeling structure having a fluid inlet and fluid outlet, heat transferring from each of the thermal components to a fluid after the fluid enters through the fluid inlet and before the fluid exits out of the fluid outlet (see figures 2, 3, and 5).

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Therefore it would be obvious to modify Diemunsch's invention by providing a fluid-channeling structure on the frame, the fluid-channeling structure having a fluid inlet and fluid outlet, heat transferring from each of the thermal components to a fluid after the fluid enters through the fluid inlet and before the fluid exits out of the fluid outlet in order to increase the cooling process.

Referring to claims 19 and 22, Diemunsch discloses the applicant's invention as claimed with the exception of stating that the electronic component generates at least 100W.

Patel discloses a cooling apparatus for computer subsystem that does state that the electronic component generates at least 100W. Therefore it would be obvious to modify Diemunsch's invention by stating that the electronic system generates at least 100W so that one knows how much load the cooling system can handle.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Diemunsch US Patent No. 6,088,223 in view of Ohashi et al. US Patent No. 5,504,924.

Diemunsch discloses the applicant's invention as claimed with the exception of providing an evaporator block that has first and second opposing internal surfaces defining the evaporator block internal volume, the first internal surface being located between the electronic component and the second internal surface, the capillary wicking material having first and second opposed sides, the first side being located against the first internal surface and the second side being located distant from the second internal surface, so that a gap is defined between the second side and the second internal surface, the evaporator block outlet leading out of the gap.

Ohashi discloses a cooling system of electronic computer using flexible members in contact with semiconductor devices on boards that does provide an evaporator block that has first

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and second opposing internal surfaces defining the evaporator block internal volume, the first internal surface being located between the electronic component and the second internal surface, the capillary wicking material having first and second opposed sides, the first side being located against the first internal surface and the second side being located distant from the second internal surface, so that a gap is defined between the second side and the second internal surface, the evaporator block outlet leading out of the gap (see figures 1 and 3). Therefore it would be obvious to modify Diemunsch's invention by providing an evaporator block that has first and second opposing internal surfaces defining the evaporator block internal volume, the first internal surface being located between the electronic component and the second internal surface, the capillary wicking material having first and second opposed sides, the first side being located against the first internal surface and the second side being located distant from the second internal surface, so that a gap is defined between the second side and the second internal surface, the evaporator block outlet leading out of the gap in order to increase the cooling process.

Allowable Subject Matter

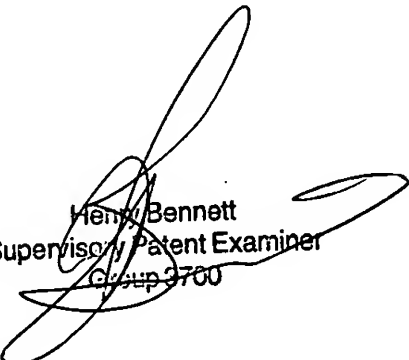
4. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Nihir Patel whose telephone number is (703) 306-3463. The examiner can normally be reached on Monday-Friday from 7:30am to 4:30pm. If attempts to reach the examiner by telephone are unsuccessful the examiner's supervisor Henry Bennett can be reached at (703) 308-0101.

NP
November 21, 2003



Henry Bennett
Supervisory Patent Examiner
Group 3700